

MEMORANDUM

DATE: Monday, July 29, 2024

TO: [REDACTED]
Senior Industrial Hygienist, DEEOIC BPRP

CC: [REDACTED]
Certified Industrial Hygienist, DEEOIC BPRP

FROM: [REDACTED]
Contract Certified Industrial Hygienist (CCIH)
Catawba Corporations

RE: Evaluation of Occupational Exposures to Toxic Materials for DEEOIC Part E
Claim for [REDACTED] (50042067)

I. Issues for Determination

The Issues for Determination, as described in the Statement of Accepted Facts (SOAF), are:

Given [REDACTED] diagnosed condition of skin cancer (SCC of left lateral forehead, BCC of right lateral malar cheek, and BCC of left distal dorsal forearm) and his work at the Idaho National Laboratory as an instrument technician from 05/22/1978 to 11/14/2007, what would be the nature, extent and duration of his exposure to arsenic and mineral oil?

II. Background

Mr. [REDACTED] was employed at the Idaho National Laboratory (INL), located in Scoville, ID, between 05/22/1978 and 11/14/2007. [REDACTED] accumulated approximately twenty-nine (29) years and six (6) months of covered employment (verified) as an Instrument Technician.

I reviewed the following documentation that was included with this Industrial Hygiene referral and relied on it to prepare the evaluation of the claimant's exposures: Occupational History Questionnaire (OHQ); EE-3 Employment History Claim Form; Site Exposure Matrices (SEM) searches conducted by the Claim Examiner; employment documentation records; and a letter from the claimant's physician.

From the documents submitted, [REDACTED] conducted instrument maintenance and calibration activities for a wide variety of instrumentation including:

- Detectors
- Transmitters
- Recorders
- Indicators
- radiological monitoring equipment including personnel monitors and criticality alarm systems (CAS) located throughout the INL in facilities such as reactors, chemical processing areas, and manufacturing/fabrication facilities.

██████████ did not specifically note any exposures to arsenic and mineral oil in case file documents. He did acknowledge utilizing a variety of personal protective equipment (PPE) including respiratory protection devices. However, he did not identify any specific tasks for which he used the PPE.

██████████ was diagnosed with three (3) cases of skin cancer. Please refer to the table below for the skin cancer types and locations.

Skin Cancer Type	Location
Squamous cell carcinoma (SCC)	Left lateral forehead
Basal cell carcinoma (BCC)	Right lateral malar cheek
Basal cell carcinoma	Left distal dorsal forearm

██████████ filed a Part E claim for these conditions on 02/15/2024.

III. Discussion

It is important to note that after the mid-1990s, environmental health and safety programs at DOE facilities were well developed and fully implemented. These programs include, but are not limited to, chemical/hazardous material management programs, strong administrative and engineering controls, the extensive use of personal protective equipment (PPE) and, where appropriate, industrial hygiene monitoring. This does not mean that employees would not have had the potential for hazardous exposures. However, it does mean that the likelihood of significant¹ exposures to toxic materials at DOE facilities was greatly reduced after the mid-1990s, and that any work processes, events, or circumstances leading to a significant exposure would likely have been identified and documented in employment records.

Arsenic is commonly used in pesticides, herbicides, fungicides, and rodenticides. It may also be present in wood preservation, glass manufacturing, and metallurgical processes. Arsenic can also be a component in certain soldering materials. The routes of exposure include inhalation, ingestion, skin contact, and skin absorption. There are data that support ██████████, in his capacity as an Instrument Technician at the INL, as having been significantly exposed to arsenic. Such exposures would have been associated with electrical maintenance activities. His exposures, as part of this position through the mid-1990s, would have likely been occasional (i.e., a biweekly basis) and would have ranged from very low to low levels. However, there is no evidence in the case file (i.e., personal and/or area industrial hygiene monitoring data, claimant provided information or documentation, or other relevant site industrial hygiene records) indicating that, as part of this position after the mid-1990s, exposures occurred that would have been considered a workplace exposure violation or incident. Any exposures that he might have received, as part of this position after the mid-1990s, would have been incidental in nature, well-controlled, and not significant. The following information, which was included with the IH referral, was reviewed: e.g., OHQ, EE-3, SEM reports.

Mineral oil is a common mixture of liquid hydrocarbons and is routinely found in electrical systems (i.e., transformers and capacitors) and/or metalworking fluids. It is a lubricant and is used as a solvent for inks in the printing industry. The routes of exposure include inhalation (of mist) and skin contact. There are data that support ██████████, in his capacity as an Instrument

Technician, as having been significantly exposed to mineral oil. Such exposures would have been associated with the use of mineral oil-based cleaners and lubricants during electrical maintenance activities. His exposures, as part of this position through the mid-1990s, would have likely been occasional (i.e., a biweekly basis) and would have ranged from very low to low levels. However, there is no evidence in the case file (i.e., personal and/or area industrial hygiene monitoring data, claimant provided information or documentation, or other relevant site industrial hygiene records) indicating that, as part of this position after the mid-1990s, exposures occurred that would have been considered a workplace exposure violation or incident. Any exposures that he might have received, as part of this position after the mid-1990s, would have been incidental in nature, well-controlled, and not significant. The following information, which was included with the IH referral, was reviewed: e.g., OHQ, EE-3, SEM reports.

IV. Conclusion

It is highly likely that Mr. [REDACTED], in his capacity as an Instrument Technician at the Idaho National Laboratory (INL), was significantly exposed to multiple toxins. Please refer to the following table for the claimant's position, toxins, nature of exposures, exposure frequencies, and exposure levels.

Instrument Technician (05/22/1978 through the mid-1990s)			
Toxin	Direct/ Area	Frequency	Exposure level
Arsenic	Direct	Occasional (i.e., a biweekly basis)	Very low to low
Mineral oil	Direct	Occasional (i.e., a biweekly basis)	Very low to low

However, there is no evidence in the case file (i.e., personal and/or area industrial hygiene monitoring data, claimant provided information or documentation, or other relevant site industrial hygiene records) indicating that, as part of this position after the mid-1990s, exposures to these agents occurred that would have been considered a workplace exposure violation or incident. Any exposures to these agents that he might have received, as part of this position after the mid-1990s, would have been incidental in nature, well-controlled, and not significant. The following information, which was included with the IH referral, was reviewed: e.g., OHQ, EE-3, SEM reports.

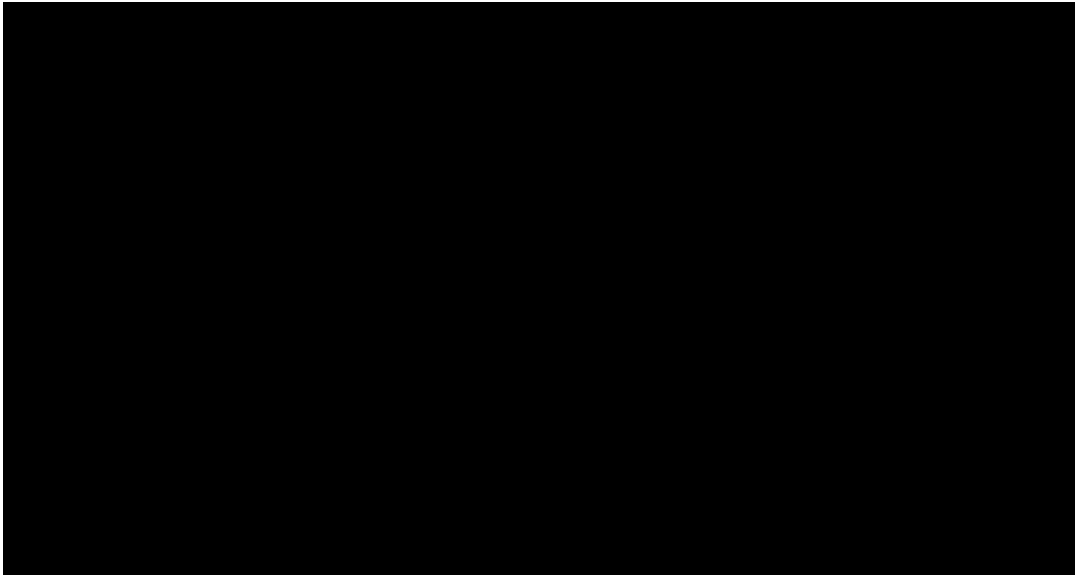
This document is for the purpose of providing supplemental information for use by a claims examiner in the development of this specific claim. It is not intended for use on other claims.

¹ A significant exposure is one that occurs at some interval of routine frequency and intensity associated with the work performed by the employee. Based upon the agent under consideration, such exposures may have occurred by inhalation, ingestion, or absorption. The IH categorizes significant exposure further as high, moderate, or low on a case-by-case basis after reviewing evidence available about the employee. In categorizing the level of exposure, the IH considers and weighs numerous factors including the following: the employee's labor classification and

type of work performed; the presence or absence of exposure monitoring data; frequency of work activities or functions performed; proximity of exposure; and temporal knowledge (historical information about workplace conditions); the use of personal protective equipment, or the likelihood that workplace controls or mitigation strategies were in place to reduce (not remove) health risks. After considering all these factors or any other available exposure data available about the employee, the IH applies their professional knowledge and judgment to assign a level of significance.

V. References

1. US Department of Labor EEOICP Site Exposure Matrices (SEM) Database.
2. US National Institutes of Health Haz-Map Database.
3. US Department of Labor Energy Compensation System (ECS) Database.
4. US Department of Energy Facility List Database.
5. Proctor and Hughes, "Chemical Hazards of the Workplace," John Wiley and Sons, 5th Edition, 2014.
6. LaDou, Joseph, M.S, M.D., "Introduction to Occupational Health and Safety," National Safety Council, 2nd Edition, 1994.
7. Harbison, Raymond D., M.S., Ph.D., "Hamilton and Hardy's Industrial Toxicology", 6th Edition, 2015.
8. Baxter, Peter J. et. al., "Hunter's Diseases of Occupations," 10th Edition, 2011.



MEMORANDUM

DATE:

TO: [REDACTED]
Senior Industrial Hygienist, DEEOIC BPRP

CC: [REDACTED]
Certified Industrial Hygienist, DEEOIC BPRP

FROM: [REDACTED]
Contract Certified Industrial Hygienist (CCIH)
Catawba Corporations

RE: Evaluation of Occupational Exposures to Toxic Materials for DEEOIC Part E
Claim for [REDACTED] (50036617)

I. Issues for Determination

The Issues for Determination, as described in the Statement of Accepted Facts (SOAF), are:

Based on Mr. [REDACTED] diagnosed condition of esophageal cancer and the work he performed at the Savannah River Site (SRS) from September 10, 1979, to March 31, 1989, as a laboratory technician (GSO2); from April 1, 1989, to July 31, 2008, as a laboratory technician/supervisor; from August 1, 2008, to September 30, 2021, as a lead technical specialist/principle specialist; what would be the nature, frequency, and duration of his exposure to asbestos, tetrachloroethylene, mineral oil, and sulfuric acids?

II. Background

Mr. [REDACTED] was employed at the Savannah River Site (SRS), located in Aiken, SC, between 09/10/1979 and 09/30/2021. [REDACTED] accumulated approximately forty-two (42) years and one (1) month of covered employment (verified) as a Laboratory Technician/GSO2, Laboratory Technician/Supervisor, and Lead Technical Specialist/Principle Specialist. Please refer to the table below for the claimant’s work history including the site of employment, timeframes of employment, duration of employment, and labor classifications.

Site	Timeframe of Covered Employment	Duration of Covered Employment (approximate)	Job Classification
SRS	09/10/1979 - 03/31/1989	9 years, 7 months	Laboratory Technician/GSO2
SRS	04/01/1989 - 07/31/2008	19 years, 4 months	Laboratory Technician/Supervisor
SRS	08/01/2008 - 09/30/2021	13 years, 2 months	Lead Technical Specialist/ Principle Specialist

	Total	42 years, 1 month	
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I reviewed the following documentation that was included with this Industrial Hygiene referral and relied on it to prepare the evaluation of the claimant's exposures: Occupational History Questionnaire (OHQ); EE-3 Employment History Claim Form; and a letter from the claimant's physician. From the documents submitted, [REDACTED] began his career conducting janitorial activities (GSO2), then transitioned to multiple progressive positions working in metallurgical laboratories performing experimental chemical and physical processing of plutonium, uranium, and non-radioactive metals. [REDACTED] specifically noted in his OHQ his exposures to asbestos throughout his career, in relation to working in older facilities containing asbestos-containing materials/insulation. However, he did not report any exposures to mineral oil, tetrachloroethylene, and sulfuric acid. He did acknowledge utilizing a variety of personal protective equipment (PPE) including respiratory protection devices. However, he did not provide identify any tasks for which he used the PPE.

[REDACTED] was diagnosed with esophageal cancer on 10/03/2022 and filed a Part E claim for this condition on 12/19/2022.

III. Discussion

It is important to note that after the mid-1990s, environmental health and safety programs at DOE facilities were well developed and fully implemented. These programs include, but are not limited to, chemical/hazardous material management programs, strong administrative and engineering controls, the extensive use of personal protective equipment (PPE) and, where appropriate, industrial hygiene monitoring. This does not mean that employees would not have had the potential for hazardous exposures. However, it does mean that the likelihood of significant¹ exposures to toxic materials at DOE facilities was greatly reduced after the mid-1990s, and that any work processes, events, or circumstances leading to a significant exposure would likely have been identified and documented in employment records.

Asbestos is a mineral silicate material and was present in, and widely used at, all Department of Energy (DOE) facilities. Historically, many common items such as Transite® products, floor tiles, thermal and electrical insulation, pump packing, gaskets, shingles, filters, fire-proofing materials, and cement contained asbestos. The primary route of exposure is through inhalation. There are data that support [REDACTED], in his capacity as a Laboratory Technician/GSO2 at the SRS, as having been significantly exposed to asbestos. Such exposures, based on activities listed in his Occupational History Questionnaire (OHQ) and EE-3 Employment History Claim Form, would have been associated with janitorial (e.g., sweeping and cleanup) activities in areas where damaged asbestos-containing materials were present, as well as during chemistry and metallurgical laboratory activities due to the presence of asbestos in various laboratory equipment (e.g., ovens, gloves, aprons, thermal pads, etc.), and Metallurgical Laboratory activities-welding activities. His exposures, as part of this position through 1986, would have likely been occasional (i.e., a biweekly basis) and would have ranged from low to moderate levels. His exposures, as part of this position after 1986, would have likely been occasional (i.e.,

a biweekly basis) and would have ranged from very low to low levels. There are also data that support [REDACTED], in his capacity as a Laboratory Technician/Supervisor at the SRS, as having been significantly exposed to asbestos. Such exposures, based on activities listed in his OHQ and EE-3 Employment History Claim Form, would have been associated with periodically entering and occupying areas where damaged asbestos-containing materials were present, as well as chemistry and metallurgical laboratory activities due to the presence of asbestos in various laboratory equipment (e.g., ovens, gloves, aprons, thermal pads, etc.), and Metallurgical Laboratory activities-welding activities. His exposures, as part of this position through the mid-1990s, would have likely been occasional (i.e., a biweekly basis) and would have ranged from very low to low levels. However, there is no evidence in the case file (i.e., personal and/or area industrial hygiene monitoring data, claimant provided information or documentation, or other relevant site industrial hygiene records) indicating that, as part of this position after the mid-1990s, exposures occurred that would have been considered a workplace exposure violation or incident. Any exposures that he might have received, as part of this position after the mid-1990s, would have been incidental in nature, well-controlled, and not significant. Additionally, there are data, as noted in his OHQ, that support [REDACTED], in his capacity as a Lead Technical Specialist/Principle Specialist at the SRS, as having had the potential for exposures to asbestos. However, there is no evidence in the case file (i.e., personal and/or area industrial hygiene monitoring data, claimant provided information or documentation, or other relevant site industrial hygiene records) indicating that, as part of this position during the subject time frame (i.e., between 08/01/2008 and 09/30/2021), exposures occurred that would have been considered a workplace exposure violation or incident. Any exposures that he might have received, as part of this position during the subject time frame, would have been incidental in nature, well-controlled, and not significant.

Mineral oil is a common mixture of liquid hydrocarbons and is routinely found in electrical systems (i.e., transformers and capacitors) and/or metalworking fluids. It is a lubricant and is used as a solvent for inks in the printing industry. The routes of exposure include inhalation (of mist) and skin contact. There are data that support [REDACTED], in his capacity as a Laboratory Technician/GSO2, as having been significantly exposed to mineral oil. Such exposures, based on activities listed in his OHQ and EE-3 Employment History Claim Form, would have been associated with chemistry laboratory activities (mineral oil is sometimes used as part of chemical analyses as well as during laboratory equipment maintenance). His exposures, as part of this position, would have likely been occasional (i.e., a biweekly basis) and would have ranged from very low to low levels. There are also data that support [REDACTED], in his capacity as a Laboratory Technician/Supervisor, as having been significantly exposed to mineral oil. Such exposures, based on activities listed in his OHQ and EE-3 Employment History Claim Form, would have been associated with chemistry laboratory activities (mineral oil is sometimes used as part of chemical analyses as well as during laboratory equipment maintenance). His exposures, as part of this position through the mid-1990s, would have likely been occasional (i.e., a biweekly basis) and would have ranged from very low to low levels. However, there is no evidence in the case file (i.e., personal and/or area industrial hygiene monitoring data, claimant provided information or documentation, or other relevant site industrial hygiene records) indicating that, as part of this position after the mid-1990s, exposures occurred that would have been considered a workplace exposure violation or incident. Any exposures that he might have

received, as part of this position after the mid-1990s, would have been incidental in nature, well-controlled, and not significant. Additionally, there are data, based on activities listed in his OHQ and EE-3 Employment History Claim Form, that support ██████████, in his capacity as a Lead Technical Specialist/Principle Specialist, as having had the potential for exposures to mineral oil. However, there is no evidence in the case file (i.e., personal and/or area industrial hygiene monitoring data, claimant provided information or documentation, or other relevant site industrial hygiene records) indicating that, as part of this position during the subject time frame (i.e., between 08/01/2008 and 09/30/2021), exposures occurred that would have been considered a workplace exposure violation or incident. Any exposures that he might have received, as part of this position during the subject time frame, would have been incidental in nature, well-controlled, and not significant.

Sulfuric acid is a strong chemical that is corrosive. It is contained in lead car batteries and is also commonly used in industrial detergents, chemical munitions, laboratory reagents, and fertilizers. The primary routes of exposure are through inhalation and skin contact. There are data that support Mr. ██████████, in his capacity as a Laboratory Technician/GSO2, as having been significantly exposed to sulfuric acid. Such exposures, based on activities listed in his OHQ and EE-3 Employment History Claim Form, would have been associated with chemistry laboratory activities, metallography operations, and Metallurgical Laboratory activities. His exposures, as part of this position, would have likely been occasional (i.e., a biweekly basis) and would have ranged from very low to low levels. There are also data that support Mr. ██████████, in his capacity as a Laboratory Technician/Supervisor, as having been significantly exposed to sulfuric acid. Such exposures, based on activities listed in his OHQ and EE-3 Employment History Claim Form, would have been associated with chemistry laboratory activities, metallography operations, and Metallurgical Laboratory activities. His exposures, as part of this position, would have likely been occasional (i.e., a biweekly basis) and would have ranged from very low to low levels. However, there is no evidence in the case file (i.e., personal and/or area industrial hygiene monitoring data, claimant provided information or documentation, or other relevant site industrial hygiene records) indicating that, as part of this position after the mid-1990s, exposures occurred that would have been considered a workplace exposure violation or incident. Any exposures that he might have received, as part of this position after the mid-1990s, would have been incidental in nature, well-controlled, and not significant. Additionally, there are data, based on activities listed in his OHQ and EE-3 Employment History Claim Form, that support Mr. ██████████, in his capacity as a Lead Technical Specialist/Principle Specialist, as having had the potential for exposures to sulfuric acid. However, there is no evidence in the case file (i.e., personal and/or area industrial hygiene monitoring data, claimant provided information or documentation, or other relevant site industrial hygiene records) indicating that, as part of this position during the subject time frame (i.e., between 08/01/2008 and 09/30/2021), exposures occurred that would have been considered a workplace exposure violation or incident. Any exposures that he might have received, as part of this position during the subject time frame, would have been incidental in nature, well-controlled, and not significant.

Tetrachloroethylene (also known as perchloroethylene) is a colorless liquid with a mild, chloroform-like odor. It is used as a vapor-degreasing solvent, drying agent for metals, and a heat-transfer medium. It has been used at Department of Energy (DOE) sites for boiler and pressure vessel erection, repairs and testing, decontamination, electrical maintenance, HVAC

maintenance, sheet metal fabrication, and plumbing/pipefitting activities. The routes of exposure include inhalation, ingestion, skin contact, and skin absorption. There are data that support Mr. ██████ in his capacity as a Laboratory Technician/GSO2, as having been significantly exposed to tetrachloroethylene. Such exposures, based on activities listed in his OHQ and EE-3 Employment History Claim Form, would have been associated with utilizing tetrachloroethylene chemistry laboratory activities. His exposures, as part of this position, would have likely been occasional (i.e., a biweekly basis) and would have ranged from very low to low levels. There are also data that support ██████, in his capacity as a Laboratory Technician/Supervisor, as having been significantly exposed to tetrachloroethylene. Such exposures, based on activities listed in his OHQ and EE-3 Employment History Claim Form, would have been associated with utilizing tetrachloroethylene chemistry laboratory activities. His exposures, as part of this position, would have likely been occasional (i.e., a biweekly basis) and would have ranged from very low to low levels. However, there is no evidence in the case file (i.e., personal and/or area industrial hygiene monitoring data, claimant provided information or documentation, or other relevant site industrial hygiene records) indicating that, as part of this position after the mid-1990s, exposures occurred that would have been considered a workplace exposure violation or incident. Any exposures that he might have received, as part of this position after the mid-1990s, would have been incidental in nature, well-controlled, and not significant. Additionally, there are data, based on activities listed in his OHQ and EE-3 Employment History Claim Form, that support ██████, in his capacity as a Lead Technical Specialist/Principle Specialist, as having had the potential for exposures to tetrachloroethylene. However, there is no evidence in the case file (i.e., personal and/or area industrial hygiene monitoring data, claimant provided information or documentation, or other relevant site industrial hygiene records) indicating that, as part of this position during the subject time frame (i.e., between 08/01/2008 and 09/30/2021), exposures occurred that would have been considered a workplace exposure violation or incident. Any exposures that he might have received, as part of this position during the subject time frame, would have been incidental in nature, well-controlled, and not significant.

IV. Conclusion

It is highly likely that Mr. ██████, in his capacity as a Laboratory Technician/GSO2 at the Savannah River Site (SRS), was significantly exposed to multiple toxins. Please refer to the following table for his position, toxins, nature of exposures, exposure frequencies, and exposure levels.

Laboratory Technician/GSO2 (09/10/1979 – 03/31/1989)			
Toxin	Direct/ Area	Frequency	Exposure level
Asbestos (through 1986)	Both	Occasional (i.e., a biweekly basis)	Low to moderate
Asbestos (after 1986)	Both	Occasional (i.e., a biweekly basis)	Very low to low
Mineral oil	Direct	Occasional (i.e., a biweekly basis)	Very low to low
Sulfuric acid	Both	Occasional (i.e., a biweekly basis)	Very low to low

Tetrachloroethylene	Both	Occasional (i.e., a biweekly basis)	Very low to low
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It is also highly likely that ██████████ in his capacity as a Laboratory Technician/Supervisor at the Savannah River Site (SRS), was significantly exposed to multiple toxins. Please refer to the following table for his position, toxins, nature of exposures, exposure frequencies, and exposure levels.

Laboratory Technician/Supervisor (04/01/1989 through the mid-1990s)			
Toxin	Direct/ Area	Frequency	Exposure level
Asbestos	Both	Occasional (i.e., a biweekly basis)	Very low to low
Mineral oil	Direct	Occasional (i.e., a biweekly basis)	Very low to low
Sulfuric acid	Both	Occasional (i.e., a biweekly basis)	Very low to low
Tetrachloroethylene	Both	Occasional (i.e., a biweekly basis)	Very low to low

However, there is no evidence in the case file (i.e., personal and/or area industrial hygiene monitoring data, claimant provided information or documentation, or other relevant site industrial hygiene records) indicating that, as part of this position after the mid-1990s, exposures to these agents occurred that would have been considered a workplace exposure violation or incident. Any exposures to these agents that he might have received, as part of this position after the mid-1990s, would have been incidental in nature, well-controlled, and not significant.

Additionally, although ██████████, in his capacity as a Lead Technical Specialist/Principle Specialist at the SRS, would have had the potential for exposures to asbestos, mineral oil, sulfuric acid, and tetrachloroethylene, there is no evidence in the case file (i.e., personal and/or area industrial hygiene monitoring data, claimant provided information or documentation, or other relevant site industrial hygiene records) indicating that, as part of this position during the subject time frame (i.e., between 08/01/2008 and 09/30/2021), exposures to this agent occurred that would have been considered a workplace exposure violation or incident. Any exposures to this agent that she might have received, as part of this position during the subject time frame, would have been incidental in nature, well-controlled, and not significant.

This document is for the purpose of providing supplemental information for use by a claims examiner in the development of this specific claim. It is not intended for use on other claims.

¹ A significant exposure is one that occurs at some interval of routine frequency and intensity associated with the work performed by the employee. Based upon the agent under consideration, such exposures may have occurred by inhalation, ingestion, or absorption. The IH categorizes significant exposure further as high, moderate, or low on a case-by-case basis after reviewing evidence available about the employee. In categorizing the level of exposure, the IH considers and weighs numerous factors including the following: the employee’s labor classification and type of work performed; the presence or absence of exposure monitoring data; frequency of work

activities or functions performed; proximity of exposure; and temporal knowledge (historical information about workplace conditions); the use of personal protective equipment, or the likelihood that workplace controls or mitigation strategies were in place to reduce (not remove) health risks. After considering all these factors or any other available exposure data available about the employee, the IH applies their professional knowledge and judgment to assign a level of significance.

V. References

1. US Department of Labor EEOICP Site Exposure Matrices (SEM) Database.
2. US National Institutes of Health Haz-Map Database.
3. US Department of Labor Energy Compensation System (ECS) Database.
4. US Department of Energy Facility List Database.
5. Proctor and Hughes, "Chemical Hazards of the Workplace," John Wiley and Sons, 5th Edition, 2014.
6. LaDou, Joseph, M.S, M.D., "Introduction to Occupational Health and Safety," National Safety Council, 2nd Edition, 1994.
7. Harbison, Raymond D., M.S., Ph.D., "Hamilton and Hardy's Industrial Toxicology", 6th Edition, 2015.
8. Baxter, Peter J. et. al., "Hunter's Diseases of Occupations," 10th Edition, 2011.

MEMORANDUM

DATE: Monday, July 29, 2024

TO: [REDACTED]
Senior Industrial Hygienist, DEEOIC BPRP

CC: [REDACTED]
Certified Industrial Hygienist, DEEOIC BPRP

FROM: [REDACTED]
Contract Certified Industrial Hygienist (CCIH)
Catawba Corporations

RE: Evaluation of Occupational Exposures to Toxic Materials for DEEOIC Part E
Claim for [REDACTED] (50014273)

I. Issues for Determination

The Issues for Determination, as described in the Statement of Accepted Facts (SOAF), are:

Given Mr. [REDACTED] contractor work as a electrician at the Portsmouth Gaseous Diffusion Plant (PORTS) from 7/28/1975 to 10/3/1983; 8/12/1985 to 8/22/1988; 5/2001 to 7/05/2006, please describe the nature, duration, and extent of his exposure to arsenic pentafluoride and mineral oil.

Given Mr. [REDACTED] contractor work as an instrument mechanic at the PORTS from 10/18/1992 to 7/1998, please describe the nature, duration, and extent of his exposure to arsenic pentafluoride.

II. Background

Mr. [REDACTED] was intermittently employed at the Portsmouth Gaseous Diffusion Plant (PORTS), located in Piketon, OH, between 07/28/1975 and 07/05/2006. Mr. [REDACTED] accumulated approximately twenty-two (22) years and one (1) month of covered employment (verified) as an Electrician and Instrument Mechanic. It should be noted that a previous referral for Mr. [REDACTED] was evaluated and submitted on 02/05/2024. However, there is no overlap of Issues for Determination between the previous referral and this current referral. Please refer to the table below for the claimant’s work history including the site of employment, timeframes of employment, duration of employment, and labor classifications.

Site	Timeframe of Covered Employment	Duration of Covered Employment (approximate)	Job Classification
PORTS	07/28/1975 – 10/03/1983 08/12/1985 – 08/22/1988	8 years, 2 months 3 years	Electrician

PORTS	10/18/1992 – 07/1998	5 years, 9 months	Instrument Mechanic
PORTS	05/2001 – 07/05/2006	5 years, 2 months	Electrician
	Total	22 years, 1 month	

I reviewed the following documentation that was included with this Industrial Hygiene referral and relied on it to prepare the evaluation of the claimant's exposures: Occupational History Questionnaire (OHQ); EE-3 Employment History Claim Form; Site Exposure Matrices (SEM) searches conducted by the Claim Examiner; Mr. [REDACTED] resume; and site Industrial Hygiene (IH) records. From the documents submitted, Mr. [REDACTED] installed, maintained, calibrated, and repaired electrical systems, motors, electronics, and instrumentation throughout the PORTS Plant. Mr. [REDACTED] did not specifically note any exposures to arsenic pentafluoride in case file documents. However, [REDACTED] did report exposures to arsenic, which in the presence of uranium hexafluoride in site process system could have resulted in arsenic pentafluoride. Additionally, Mr. [REDACTED] did not specifically note any exposures to mineral oil in case file documents, but Mr. [REDACTED] resume and site IH records indicate that he worked on transformers which often contain mineral oil. He did acknowledge utilizing a variety of personal protective equipment (PPE) including respiratory protection devices. However, he did not identify any specific tasks for which he used the PPE.

Mr. [REDACTED] was diagnosed with basal cell carcinoma (BCC) on the left side face. He originally filed a Part E claim for other condition on 01/20/2017. This claim was subsequently amended to include the BCC diagnosis.

III. Discussion

It is important to note that after the mid-1990s, environmental health and safety programs at DOE facilities were well developed and fully implemented. These programs include, but are not limited to, chemical/hazardous material management programs, strong administrative and engineering controls, the extensive use of personal protective equipment (PPE) and, where appropriate, industrial hygiene monitoring. This does not mean that employees would not have had the potential for hazardous exposures. However, it does mean that the likelihood of significant¹ exposures to toxic materials at DOE facilities was greatly reduced after the mid-1990s, and that any work processes, events, or circumstances leading to a significant exposure would likely have been identified and documented in employment records.

Arsenic pentafluoride is a colorless gas compound of arsenic and fluorine. The gas forms white clouds in moist air. It is used in electroconductive polymers as a doping agent, to make pesticides and insecticides, and it is also used in the glass industry. The primary routes of exposure are inhalation and skin contact. There are data that support Mr. [REDACTED], in his capacity as an Electrician at the PORTS Plant, as having been significantly exposed to arsenic pentafluoride. Such exposures would have been associated with fugitive arsenic pentafluoride emissions from process systems encountered during cascade process equipment maintenance activities. Although trace amounts of arsenic were already present in the cascade system, a NIOSH report (Reference 9) indicates that in the 1980s, additional arsenic was introduced into the cascades at the PORTS Plant. This arsenic, in combination with uranium hexafluoride, had

the potential to result in the presence of arsenic pentafluoride in the cascade process systems. Therefore, his exposures, as part of this position through 1979, would have likely been occasional (i.e., a biweekly basis) and would have been at very low levels. His exposures, as part of this position after 1979 and through 08/22/1988, would have likely been occasional (i.e., a biweekly basis) and would have ranged from very low to low levels. However, there is no evidence in the case file (i.e., personal and/or area industrial hygiene monitoring data, claimant provided information or documentation, or other relevant site industrial hygiene records) indicating that, as part of this position after 05/2001, exposures occurred that would have been considered a workplace exposure violation or incident. Any exposures that he might have received, as part of this position after 05/2001, would have been incidental in nature, well-controlled, and not significant. There are also data that support Mr. [REDACTED], in his capacity as an Instrument Mechanic at the PORTS Plant, as having been significantly exposed to arsenic pentafluoride. Such exposures would have been associated with fugitive arsenic pentafluoride emissions from process systems encountered during cascade process equipment maintenance activities. His exposures, as part of this position through the mid-1990s, would have likely been occasional (i.e., a biweekly basis) and would have ranged from very low to low levels. However, there is no evidence in the case file (i.e., personal and/or area industrial hygiene monitoring data, claimant provided information or documentation, or other relevant site industrial hygiene records) indicating that, as part of this position after the mid-1990s, exposures occurred that would have been considered a workplace exposure violation or incident. Any exposures that he might have received, as part of this position after the mid-1990s, would have been incidental in nature, well-controlled, and not significant.

Mineral oil is a common mixture of liquid hydrocarbons and is routinely found in electrical systems (i.e., transformers and capacitors) and/or metalworking fluids. It is a lubricant and is used as a solvent for inks in the printing industry. The routes of exposure include inhalation (of mist) and skin contact. There are data that support Mr. [REDACTED], in his capacity as an Electrician, as having been significantly exposed to mineral oil. Such exposures would have been associated with electrical maintenance activities due to the use of mineral oil as a lubricant and cleaning agent and as a dielectric fluid in various electronic equipment such as transformers and capacitors. His exposures, as part of this position through 08/22/1988, would have likely been occasional (i.e., a biweekly basis) and would have ranged from low to moderate levels. However, there is no evidence in the case file (i.e., personal and/or area industrial hygiene monitoring data, claimant provided information or documentation, or other relevant site industrial hygiene records) indicating that, as part of this position after 05/2001, exposures occurred that would have been considered a workplace exposure violation or incident. Any exposures that he might have received, as part of this position after 05/2001, would have been incidental in nature, well-controlled, and not significant.

IV. Conclusion

It is highly likely that Mr. [REDACTED], in his capacity as an Electrician at the Portsmouth Gaseous Diffusion Plant (PORTS), was significantly exposed to multiple toxins. Please refer to the following table for his position, toxins, nature of exposures, exposure frequencies, and exposure levels.

Electrician (intermittently 07/28/1975 through the mid-1990s)			
Toxin	Direct/ Area	Frequency	Exposure level
Arsenic pentafluoride (through 1979)	Both	Occasional (i.e., a biweekly basis)	Very low
Arsenic pentafluoride (after 1979)	Both	Occasional (i.e., a biweekly basis)	Very low to low
Mineral oil	Direct	Occasional (i.e., a biweekly basis)	Low to moderate

However, there is no evidence in the case file (i.e., personal and/or area industrial hygiene monitoring data, claimant provided information or documentation, or other relevant site industrial hygiene records) indicating that, as part of this position after 05/2001, exposures to these agents occurred that would have been considered a workplace exposure violation or incident. Any exposures to these agents that he might have received, as part of this position after 05/2001, would have been incidental in nature, well-controlled, and not significant.

It is also highly likely that [REDACTED], in his capacity as an Instrument Mechanic at the PORTS Plant, was significantly exposed to arsenic pentafluoride. Please refer to the following table for his position, toxin, nature of exposure, exposure frequency, and exposure levels.

Instrument Mechanic (10/18/1992 through the mid-1990s)			
Toxin	Direct/ Area	Frequency	Exposure level
Arsenic pentafluoride	Both	Occasional (i.e., a biweekly basis)	Very low to low

However, there is no evidence in the case file (i.e., personal and/or area industrial hygiene monitoring data, claimant provided information or documentation, or other relevant site industrial hygiene records) indicating that, as part of this position after the mid-1990s, exposures to this agent occurred that would have been considered a workplace exposure violation or incident. Any exposures to this agent that he might have received, as part of this position after the mid-1990s, would have been incidental in nature, well-controlled, and not significant.

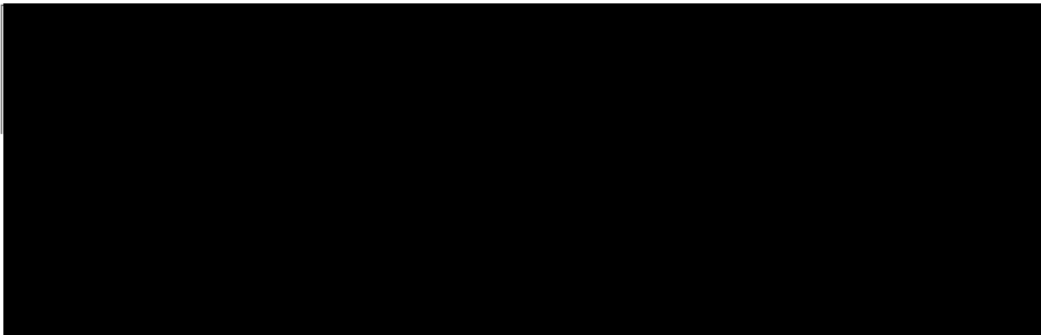
This document is for the purpose of providing supplemental information for use by a claims examiner in the development of this specific claim. It is not intended for use on other claims.

¹ A significant exposure is one that occurs at some interval of routine frequency and intensity associated with the work performed by the employee. Based upon the agent under consideration, such exposures may have occurred by inhalation, ingestion, or absorption. The IH categorizes significant exposure further as high, moderate, or low on a case-by-case basis after reviewing evidence available about the employee. In categorizing the level of exposure, the IH considers and weighs numerous factors including the following: the employee's labor classification and type of work performed; the presence or absence of exposure monitoring data; frequency of work

activities or functions performed; proximity of exposure; and temporal knowledge (historical information about workplace conditions); the use of personal protective equipment, or the likelihood that workplace controls or mitigation strategies were in place to reduce (not remove) health risks. After considering all these factors or any other available exposure data available about the employee, the IH applies their professional knowledge and judgment to assign a level of significance.

V. References

1. US Department of Labor EEOICP Site Exposure Matrices (SEM) Database.
2. US National Institutes of Health Haz-Map Database.
3. US Department of Labor Energy Compensation System (ECS) Database.
4. US Department of Energy Facility List Database.
5. Proctor and Hughes, "Chemical Hazards of the Workplace," John Wiley and Sons, 5th Edition, 2014.
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7. Harbison, Raymond D., M.S., Ph.D., "Hamilton and Hardy's Industrial Toxicology", 6th Edition, 2015.
8. Baxter, Peter J. et. al., "Hunter's Diseases of Occupations," 10th Edition, 2011.
9. NIOSH Health Hazard Evaluation Report No. HETA-94-0077-2568, Lockheed Martin Utility Services, Inc., Piketon, Ohio 4566, April 1996.



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